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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,748	05/09/2006	Masaya Yano	UNIU79.069APC	5893

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KNOBBE MARTENS OLSON & BEAR LLP  
2040 MAIN STREET  
FOURTEENTH FLOOR  
IRVINE, CA 92614

EXAMINER
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MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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09/21/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com  
eOAPilot@kmob.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/595,748	<b>Applicant(s)</b> YANO ET AL.	
	<b>Examiner</b> JULIAN MERCADO	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-20 is/are rejected.
- 7) ☒ Claim(s) 3 and 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                                             |                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6-18-09 and 5-9-06</u> . | 6) <input type="checkbox"/> Other: ____.                                                |

## **DETAILED ACTION**

### ***Remarks***

Claims 1 and 3-20 are pending.

### ***Information Disclosure Statement***

The Information Disclosure Statement (IDS) filed on June 18, 2009 and May 9, 2006 has been considered by the examiner except where lined-through, as these documents cannot be located in the file.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the instant "thickness of a *circumferential part* of at least one of the anode-side metal plate and the cathode-side metal plate" (as recited in claim 9) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Emphasis added to thickness of the *circumferential part* of the plates indicated by reference character [5a] in the drawings.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure

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must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 3 and 4 are objected to because of the following informalities:

- In claims 3 and 4, it is suggested to change "flow path groove formed" to --flow path groove is formed--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which

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it is most nearly connected, to make and/or use the invention. Claim 9 recites the limitation "a thickness of a circumferential part" of one of the metal plates. At best, the disclosure appears to merely disclose that with respect to the circumferential parts of the metal plates, one circumferential part is greater than the other. See page 14, par. [0038] of the specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 9, 10 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites "a metal plate" in line 4. As claim 5 depends from claim 1 itself which already recites metal plates, it is unclear if the metal plate in claim 5 is mutually exclusive from the previously recited metal plates. It appears to the examiner that the metal plate in claim 5 is one of the metal plates recited in claim 1.

Claim 9 recites the limitation "of other part". This limitation is unclear in reference; it appears to the examiner that the claim intends to recite a smaller thickness of a circumferential part in comparison to another part of the same plate (which is not specified) or in comparison to the other plate.

Claim 10 recites the limitation "supplying oxygen in the air". This limitation is unclear insofar as supplying oxygen in the air (which already contains oxygen). It appears to the examiner that "oxygen in the air" should be changed to either --oxygen-- or --air--.

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Claim 12 recites the limitation "an external circumferential part of one metal plate is greater than..." in line 2. This limitation is unclear as the unit or dimension of one plate being greater (e.g. width, thickness, weight) is not stated.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 9 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Brückner et al. (2002/0015873)

For purposes of detailed discussion Brückner et al. (U.S. Pat. 6,638,656) is cited herein.

For claims 1, 7, 9 and 12, Brückner et al. teaches a fuel cell comprising a sheet-like solid polymer electrolyte, a cathode-side electrode plate on one side and an anode-side electrode plate arranged on the other, a cathode-side and anode-side metal plate [1] (in duplicate) arranged on a corresponding surface of the cathode and anode electrode plate, wherein a circumferential part of the solid polymer electrolyte is extended from the electrode plates on both sides and circumferences of the metal plates on both sides are mechanically sealed. See col. 1 line 53 et seq. To the extent that claim 12 is understood for the reasons set forth under 35 U.S.C. 112, second paragraph, it is noted that the claimed "surface... used as a current taking out part" has not been given patentable weight, as this limitation is drawn to a statement of intended use, though Brückner et al. specifically disclose the metal plates as "terminal plates" and are considered to

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function in the intended manner insofar as a "stacked connection of the complete cells" would requisitely have the mutually adjacent surfaces of the stacked fuel cells in series connection.

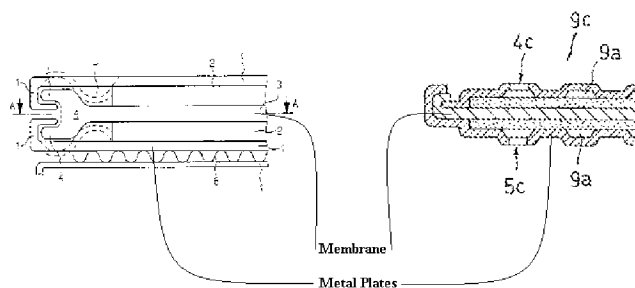
Notwithstanding the 35 U.S.C. 112, first paragraph rejection of claim 9, Figure 1 of Brückner et al. is relied upon to shown that at the circumferential part the metal plates have a smaller thickness. The mechanical sealing (see col. 2 lines 40-48) is as follows:

According to an advantageous configuration of the invention, the edge of the membrane is grooved and/or U-shaped, and the edges of the two terminal plates are of the same configuration, likewise being grooved and/or U-shaped, so that the upper and lower terminal plates are hooked into the respective groove wall of the membrane edge. The membrane is made from a sealing material, so that a seal is formed as a result of the terminal plates being hooked into the groove of the membrane edge.

As to the mechanical sealing being "by bending press", a flow path groove "formed by press processing" or "formed by etching" or "made smaller by etching", these process limitations are not given patentable weight as the limitations do not give breadth or scope to the product claim. The claimed product appears to be the same or similar to the prior art product insofar as being a fuel cell having a circumferential part of its solid polymer electrolyte mechanically sealed by circumferences of metal plates. In the event that any differences can be shown by the product of the product-by-process claim, such differences would have been obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results. *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985). A comparison of the Figures is appended herein:

**PRIOR ART**

**CLAIMED INVENTION**



***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brückner et al. (2002/0015873) in view of Wilkinson et al. (U.S. Pat. 5,432,021)

The teachings of Brückner et al. are discussed above. For the foregoing reasons, the process limitations of "press processing", "etching" and "laser irradiation" are not given patentable weight, as the limitations do not give breadth or scope to the product claim.

Brückner et al. does not explicitly teach a flow path groove with an inlet and outlet (i.e. openings) on the metal plate communicating therewith. However, Wilkinson et al. disclose flow path grooves [64a] on both the anode and cathode external surfaces, where the electrodes are typically carbon fiber paper. See Fig. 3 and col. 11 line 63 et seq. As common in fuel cells, reactant feed [124] (i.e. inlet) and exhaust manifold [126] (i.e. outlet) openings from anode and cathode plates direct fuel and oxygen to the anode and cathode, respectively. See col. 2 lines 3-9 and lines 21-29. The skilled artisan would find obvious to modify Brückner et al. by employing flow path grooves, inlets and outlets in its fuel cell in order to facilitate the transport of reactant gases.

Claims 8, 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brückner et al. (2002/0015873) in view of Allen (U.S. Pat. 6,777,126).



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The teachings of Brückner et al. are discussed above.

Brückner et al. does not explicitly teach an insulating material or sealing member between the metal plate and the electrolyte. However, Allen discloses the use of a "gasket and/or brazing materials" to provide a seal for a crimped corner [200] of a gas chamber. See col. 13 line 11 et seq. The skilled artisan would find obvious to modify Brückner et al. by employing an insulating material such as a gasket in order to further enhance the sealing qualities of the crimped corner. (Ib.)

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brückner et al. (2002/0015873) in view of Wilkinson et al. (U.S. Pat. 5,432,021) and further in view of Allen (U.S. Pat. 6,777,126).

The teachings of Brückner et al. in view of Wilkinson et al. are discussed above.

Claims 16 and 17 recite a method of producing the claimed fuel cell with the step of mechanically sealing parameters of the metal plates by bending press. In Brückner et al., the metal plates are sealed starting with the plates being straight or flat, then formed by a joining operation so that the outer edge of the plates are in the meandering form of a "U-shaped edge". See Brückner et al. in col. 3 line 60 et seq. This step of forming an initially straight or flat stock of metal to a U-shaped edge is considered to teach or at least suggest a mechanical operation of pressing or applying bending pressure to the metal, or at least as would be obvious to the skilled artisan. Additionally, Allen disclose a known process of "Stretch-forming" as a means to form sheet materials into complex shapes...." See Allen in col. 4 line 56 et seq. Alternatively, Allen disclose that flow channels may be formed by "progressive tooling" which produces complex

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*stampings*. See col. 4 line 20 et seq. Thus, the prior art as a whole is considered to teach the claimed sealing of the metal plates by bending press, or as least as would be obvious for reasons such as forming a metal sheet into the desired complex shape of a U-shaped edge as called for in Brückner et al.

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brückner et al. (2002/0015873) in view of Wilkinson et al. (U.S. Pat. 5,432,021) and Allen (U.S. Pat. 6,777,126), and further in view of Pratt et al. (U.S. Pat. 6,132,895).

The teachings of Brückner et al. in view of Wilkinson et al. and Allen are discussed above.

As to forming the flow channels by etching, Pratt et al. disclose that chemical etching results in channels that have a surface that is microscopically rough which aids in gas flow distribution and heat exchange, also coupled with laser milling, i.e. laser irradiation. See Pratt et al. in col. 4 line 46 et seq. and col. 5 line 21 et seq. The skilled artisan would find obvious to further modify Brückner et al. by forming its flow channels by etching and/or laser irradiation. The motivation for such a modification is in view of its improved gas flow, heat efficiency, accuracy and cost-effectiveness. (Ib.)

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

/Julian Mercado/  
Examiner, Art Unit 1795

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795